

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Applicant: Shlomo Novotny

App. No.: 10/774,314

Filed: February 6, 2004

Title: COOLING FAILURE MITIGATION FOR
AN ELECTRONICS ENCLOSURE

Conf. No.: 8526

Art Unit: 2835

Examiner: Vortman, Anatoly

APPEAL BRIEF

MAIL STOP APPEAL BRIEF - PATENTS

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

Applicant (hereafter "Appellant") hereby submits this Appeal Brief in response to the to the final Office action mailed January 30, 2007 and the Notice of Appeal filed on April 30, 2007 in the above-captioned case. This Appeal Brief is submitted with a petition for a one month extension of time to reply making it due on or before July 30, 2007.

Appellant respectfully requests consideration of this appeal by the Board of Patent Appeals and Interferences (hereafter the "Board").

An oral hearing is not requested at this time.

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I. REAL PARTY IN INTEREST

The invention is assigned to Sun Microsystems, Inc. of 4150 Network Circle, Santa Clara, California 95054.

II. RELATED APPEALS AND INTERFERENCES

To the best of Appellant's knowledge, there are no appeals or interferences that are related to, will directly affect, will be directly affected by, or have a bearing on the Board's decision in the present appeal.

III. STATUS OF THE CLAIMS

Claims 1-6, 9-21 and 23-36 are currently pending in the above-referenced application. The rejections of all of the pending claims are appealed herein. No claims have been allowed. Claims 7, 8 and 22 are cancelled. A clean copy of all claims on appeal is attached hereto as the Appendix of Claims. We note that previously cancelled claims are not provided in the Appendix.

IV. STATUS OF AMENDMENTS

The last response submitted by the Applicant was dated December 12, 2006, and was in response to the Office action dated July 12, 2006. A final Office action was entered January 30, 2007, to which no further response was submitted by the Applicant. A Notice of Appeal was timely filed on April 30, 2007.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Independent claim 1 provides for a system for permitting orderly shutdown of electronic components. The system comprises an enclosure having an interior surface. In various possible implementations of the claimed invention, the enclosure may be of varying size and shape and include one or more doors, may be substantially air tight (when closed), and may include racks and other features. *See, e.g., specification, page 3, lines 9-15.* The system further includes one or more electronic components positioned within the enclosure. The electronic components may take on any number of possible forms, including those that involve integrated circuits, power supplies, circuit boards, memory modules, blade servers, etc.. *See, e.g., specification, page 3, lines 16-27.* The various electronic components housed within the enclosure generate heat that requires some level of cooling to prevent system malfunction or failure. *See, e.g., specification, page 2, lines 18-20.* Hence, the system further includes at least one fan (a device capable of moving air) positioned within the enclosure for generating airflow across the electronic components and includes a heat exchanger for cooling the airflow (e.g., a fluid to air heat exchanger, a Peltier Effect device, etc.. *See, e.g., specification, page 3, lines 28-31; page 4, lines 11-14 and 16-17; page 5, lines 7-9.*

To provide for orderly shutdown of the electronic components within the enclosure, such as might be necessary to preserve data or otherwise in the event of a cooling component (e.g., fan, heat exchange, etc.) failure, the system of claim 1 provides “a plurality of phase change material layers disposed upon the interior surface, at least one of the layers exposed to the airflow within the enclosure generated by the fan for absorbing heat from the airflow upon a failure associated with the heat exchanger, a first phase change material layers having a phase change temperature different from a second of the phase change material layers.” *See also, e.g., specification, page 6, lines 17-28.* A phase change material is one that changes state (e.g., solid to liquid and vice versa) as temperature changes. *See, e.g., specification, page 5, lines 22-24.* While changing state, however, the phase change material maintains a substantially constant temperature. *See, e.g., specification, page 5, lines 24-26.* By absorbing heat within the enclosure when the cooling system fails, the temperature within the enclosure is stabilized sufficiently long to allow for orderly shutdown of the electronic components within the system.

Claim 15 is a method for cooling one or more electronic components within an enclosure, and is similar in inventive scope to that set forth in claim 1 (recognizing that claim 1 is a system claim and claim 15 is a method claim). The method of claim 15 involves the operations of “providing an air cooling element within the enclosure” and “generating an airflow across the cooling element and one or more electronic components positioned within

the enclosure.” The enclosure may be of varying size and shape and include one or more doors, may be substantially air tight (when closed), and may include racks and other features. *See, e.g., specification, page 3, lines 9-15.* The system further includes one or more electronic components positioned within the enclosure. The electronic components may take on any number of possible forms, including those that involve integrated circuits, power supplies, circuit boards, memory modules, blade servers, etc.. *See, e.g., specification, page 3, lines 16-27.* The various electronic components housed within the enclosure generate heat that requires some level of cooling to prevent system malfunction or failure. *See, e.g., specification, page 2, lines 18-20.* Hence, the method involves providing for air cooling within the enclosure, such as through a heat exchanger and also involves providing air flow across the air cooling element and electronic components, such as through a fan (a device capable of moving air). *See, e.g., specification, page 3, lines 28-31; page 4, lines 11-14 and 16-17; page 5, lines 7-9.*

The method of claim 15 further includes the operation of “cooling the airflow using a plurality of layers of phase change material upon a failure in the cooling element, the phase change material positioned on an interior surface of the enclosure and exposed to the airflow within the enclosure generated by the fan.” *See, e.g., specification, page 5, line 21-page 6, line 20.* Unlike the system of claim 1, which involves “a first phase change material layers having a phase change temperature different from a second of the phase change material layers,” the method of claim 15 provides for a plurality of phase change layers, but does not require that the layers have different phase change temperatures.

Claim 26 is again similar in inventive scope to that set forth in claim 1, but includes some elements set forth in means plus function form pursuant to 35 U.S.C. § 112, paragraph 6, and is also distinct with respect to the scope its recitation of the use of phase change materials. More particularly, similar to claim 1, the cooling system of claim 26 involves “an enclosure” with “one or more electronic components positioned within the enclosure.” The enclosure may be of varying size and shape and include one or more doors, may be substantially air tight (when closed), and may include racks and other features. *See, e.g., specification, page 3, lines 9-15.* The electronic components may take on any number of possible forms, including those that involve integrated circuits, power supplies, circuit boards, memory modules, blade servers, etc.. *See, e.g., specification, page 3, lines 16-27.*

The various electronic components housed within the enclosure generate heat that requires some level of cooling to prevent system malfunction or failure. *See, e.g., specification, page 2, lines 18-20.* Hence, the system further includes “means for generating an airflow across the one or more electronic components” and “cooling means for cooling the airflow.” These two elements of claim 26 may be construed pursuant to 35 U.S.C. § 112, paragraph 6. The specification describes various structures for achieving the function of

generating an airflow across the one or more electronic components. Namely, the specification sets forth a fan, a blower, or other device capable of moving air positioned within the enclosure for generating airflow across the electronic components. The element, however, does not require air deflectors, shrouds, manifolds, etc., as these devices may be used to achieve the recited function but are not necessary to achieve the recited function. The specification also sets forth various structure for achieving the function of cooling the airflow, including a heat exchanger, a fluid to air heat exchanger, and a Peltier Effect device. *See, e.g., specification, page 3, lines 28-31; page 4, lines 11-14 and 16-17; page 5, lines 7-9.*

Finally, claim 26 includes the limitation of “a phase change material at least partially comprising a hydrated salt and positioned within the enclosure in the airflow generated by the means for generating an airflow across the one or more electronic components, the phase change material for absorbing heat from the airflow upon a failure in the cooling means.” Like claim 1, in the event of a cooling failure, claim 26 provides for a specific phase change material, namely a hydrated salt, positioned within the enclosure and with the airflow to absorb heat and provide sufficient time for shutdown of the electronic component in the enclosure. *See, e.g., specification, page 5, line 33.*

VI. GROUND OF REJECTION PRESENTED FOR REVIEW

A. Whether there is sufficient motivation to combine U.S. Pat. Pub. 2003/0147216 to Patel et al. (hereafter "Patel") with U.S. Pat. No. 6,170,561 to O'Grady (hereafter "O'Grady") and U.S. Pat. No. 6,317,321 to Fitch et al. (hereafter "Fitch") to render independent claims 1 (and related dependent claims), and independent claim 15 (and related dependent claims) obvious under 35 U.S.C. § 103.

B. Whether there is sufficient motivation to combine Patel with O'Grady and U.S. Pat. No. 4,259,401 to Chahrودي (hereafter "Chahrودي") to render claim 26 (and related dependent claims) obvious under 35 U.S.C. § 103.

VII. ARGUMENT

A. THE REJECTION OF INDEPENDENT CLAIMS 1 AND 15 AND THE RELATED DEPENDENT CLAIMS UNDER 35 U.S.C. § 103(e) IS IMPROPER BECAUSE THERE IS INSUFFICIENT MOTIVATION TO COMBINE THE REFERENCES

Claims 1-5, 9-13, 15-17, 19, 21 and 23 are rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Pub. US 2003/0147216 to Patel et al. (hereafter “Patel”), in view of U.S. Patent No. 6,170,561 to O’Grady (hereafter “O’Grady”) and U.S. Patent No. 6,317,321 to Fitch (hereafter “Fitch”). Claims 1 and 15 are independent claims and the remaining claims depend therefrom. The basis of rejection of the dependent claims stems from the rejection of the independent claims; accordingly, the rejection of independent claim 1 is considered first.

It is respectfully submitted that the final Office action fails to set forth a proper prima facie case of obviousness of claims 1 and 15 as there is no motivation to combine Patel with O’Grady and Fitch. The prior art references are improperly combined because they do not address the problem solved by the present invention. Given the disparate nature of the problems solved by the cited art and the fact that there is simply no explicit or reasonably inferred recognition of the problem solved by the present invention, we believe that there is insufficient motivation to combine the cited references. Moreover, we further believe that since the primary reference Patel indeed suffers from the problem solved by the present invention, there is insufficient motivation to combine the cited references.

1. There is insufficient motivation to combine Patel, O’Grady and Fitch because the references are not related to solving the problem addressed by the claimed invention, and such combination would amount to an improper hindsight conclusion.

In order to prevent improper hindsight-based obviousness analysis, a proper prima facie case of obviousness requires that there “be some suggestion or motivation, within the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify or to combine reference teachings.” *MPEP* § 2143. “It is insufficient to establish obviousness that separate elements existed in the prior art, absent some teaching, suggestion, in the prior art to combine the references.” *Arkie Lures, Inc. v. Gene Larew Tackle, Inc.*, 43 U.S.P.Q.2d 1294 (Fed. Cir. 1997). An improper hindsight obviousness determination, where the invention taught by the inventor is used against the inventor, is especially possible for relatively less technologically complex inventions. See *Ruiz v. A.B. Chance Co.*, 57 USPQ 2D 1161 (Fed. Cir. 200). There are three possible sources for a motivation to combine references: “the nature of the problem to be solved, the teaching of the prior art, and the knowledge of person in the ordinary skill in the art.” *MPEP* § 2143.01.

Independent claim 1 provides for a system and a method, respectively, involving an electronics enclosure housing electrical components and further including “a plurality of

phase change material layers disposed upon the interior surface, at least one of the layers exposed to the airflow within the enclosure generated by the fan for absorbing heat from the airflow upon a failure associated with the heat exchanger, a first phase change material layers having a phase change temperature different from a second of the phase change material layers” and claim 15 also provides for layers of phase change material, albeit differently than claim 1 as described in section V. When an electronics enclosure’s primary cooling system fails the temperature may rise so rapidly that electronics within the enclosure may shut down or fail without sufficient time for an orderly shutdown. *See Present Application, paragraph 0005*. The claimed invention solves the problem associated with providing enough time to orderly shut down the electronics by providing “a plurality of phase change material layers disposed upon the interior surface” which absorbs the heat, after a cooling failure, for a sufficient amount of time to allow an orderly shutdown of the electronics.

Recognizing the problems stemming from computer room (data center) cooling system failures, Patel solves the problem by suggesting a system for cooling electronics within an enclosure. *See Patel, e.g., paragraph 0010 and 0012*. Patel, however, is not concerned with the problems surrounding the failure of the enclosure cooling system. Patel simply does not address explicitly address any problems that might stem from failure of the enclosure cooling system.

The final Office action relies on the fact that there are two heat exchangers and fans in the Patel enclosure to argue that Patel addresses the problem. We acknowledge that Patel does provide for two heat exchangers and fans. However, we disagree that the heat exchangers and other related cooling equipment are “redundant” as set forth at page 3, line 3 of the final Office action. First, there is no explicit teaching that the heat exchangers are redundant. In fact, it would appear that both heat exchangers and fan arrangements are used cooperatively to properly cool the enclosure. As set out in Patel, one fan and heat exchanger are located at the top of the enclosure and one located at the bottom, and the arrows depicted in the drawings illustrated *separate* air flows to and from the fans and exchangers. *See, e.g., Patel Figs. 1 and 2*. Accordingly, it would appear that the systems act in concert rather than redundantly. Since Patel is particularly addressing the problems of cooling components within the enclosure rather than addressing the problems when one system fails, one would reasonably conclude that the systems of Patel are in fact cooperative and not redundant.

Moreover, “the intercoolers 18a and 18b are connected to a remote chiller (not shown) to receive a chilled medium.” *See Patel, paragraph 28*. At page 16 of the final Office action, the Examiner recognizes the non-redundant nature of the remote chiller. Hence, if the common chiller fails, both intercoolers will in turn fail to cool, for want of a chilled medium. Nowhere does Patel mention or discuss the problems that would result from

the common chiller failing. Accordingly, since Patel is silent concerning the problems of when the enclosure cooling system fails, and Patel is simply providing an enclosure cooling system rather than addressing what happens when the system fails, one of ordinary skill would likely understand Patel to suffer from the problem solved by the present invention. Patel simply provides no solution to the problem of when one or both of the cooling systems fail and some or all of the electronic components begin overheating.

The problem solved by O'Grady is even further removed from the problem solved by the present invention. O'Grady is directed to the problems associated with a cooling system failure in a data center or other room housing electrical enclosures. See *O'Grady, Col. 1, lines 10-27*. O'Grady does not address the unique problems associated with a failure of the cooling system for a discrete enclosure housing electrical components. O'Grady is only concerned with the failure of the room's cooling system. Heating, cooling, heat transfer rates, and management of all of these issues for an entire room as compared to one discrete enclosure within a room are substantially different. Accordingly, as neither Patel nor O'Grady address or appear to even involve the problems solved by the independent claims of the present invention, it is respectfully submitted that there is no motivation to combine these references to arrive at the claimed invention.

Fitch is directed to the fundamental problem of efficiently and effectively extracting heat from increasingly smaller semiconductor packages and related compact housings where conventional heat sinks are inadequate. See *Fitch Background, Col. 1, lines 33-50*. Accordingly, Fitch proposes replacing a conventional heat sink with sufficient phase change material to maintain a proper operating temperature of the semiconductor packages. The Fitch device is not concerned with resolving concerns should a cooling system fail. See *Fitch Summary, Col. 2, lines 2-30*. Accordingly, Fitch does not address or recognize the problems associated with providing for an orderly shutdown of the electronic device when a cooling system fails.

In the final Office action, it is argued that the presence of a heat exchangers is irrelevant to the instant situation since the teaching of multiple layers is used to augment the heat transfer rate. See *final Office action, page 18*. We disagree. The presence of the heat exchangers goes to the problem being solved by Fitch, and whether its proper to combine Patel, O'Grady and Fitch to arrive at the claimed invention. Since Fitch simply does not involve any problems with the failure of a cooling system, and how to allow time to orderly shut down the components, it is relevant to question of motivation and we believe in fact provides further evidence that there is insufficient motivation to combine Patel, O'Grady, and Fitch to arrive at the claimed invention.

Accordingly for at least the reasons recited above, it is respectfully submitted that there is insufficient motivation to combine Patel, O'Grady and Fitch to arrive at the invention

set forth in claims 1 and 15 and the respective dependent claims, and thus these claims are patentable under 35 U.S.C. § 103 over the recited combination.

2. There insufficient motivation to combine Patel and O'Grady because Patel suffers from the problem addressed by the claimed invention.

As argued above, besides not addressing the problems solved by the present invention, it is further submitted that the device of Patel indeed suffers from the very problem addressed by the present invention. Section 2143.01 of the MPEP discusses the case of *Ruiz v. Chance*, 69 USPQ2d 1686 (Fed. Cir. 2004) and indicates that the motivation to combine the references in that case was proper as each references addressed the same problem. As argued above, Patel provides no solution for the problem of when the common coolant supply for the heat exchangers fails and does not provide for sufficient time to orderly shut down components within the enclosure when such a failure occurs. O'Grady simply does not address the cooling systems of the enclosures themselves, and hence provides no solution concerning their failure. Accordingly, it is respectfully submitted that since Patel suffers from the problem solved by the present invention, and O'Grady simply does not address the problem solved by the present invention, there is improper motivation to combine Patel and O'Grady. Accordingly for this additional reason, it is respectfully submitted that there is insufficient motivation to combine Patel, O'Grady and Fitch to arrive at the invention set forth in claims 1 and 15 and the respective dependent claims, and thus these claims are patentable under 35 U.S.C. 103 over the recited combination.

B. THE REJECTION OF CLAIM 26 AND THE ASSOCIATED DEPENDENT CLAIM 1 UNDER 35 U.S.C. § 103(e) IS IMPROPER BECAUSE THERE IS INSUFFICIENT MOTIVATION TO COMBINE THE REFERENCES

Claims 26-29, 31-33 and 35 are rejected under 35 U.S.C. § 103 as being unpatentable over Patel in view of O'Grady and U.S. Patent No. 4,259,401 to Chahrودي (hereafter "Chahrودي"). Claim 26 is an independent claim from which the other rejected claims 27-29, 31-33 and 35 depend. Claim 26 addresses and solves the same basic problem as the invention of claims 1 and 15. Accordingly, for at least the reasons set forth in the discussion of claims 1 and 15, it is respectfully submitted that the combination of Patel and O'Grady is improper as Patel and O'Grady do not address the problems solved by the invention of claim 26, and indeed Patel suffers from the problems solved by the invention of claim 26.

Moreover, Charoubi addresses the problems associated with heating and cooling buildings. Charoubi simply has nothing to do with the problems associated with the problems solved by the present invention. Accordingly, for this additional reason, it is respectfully submitted that the combination of Patel, O'Grady and Charoubi is insufficient to render a prima facie case of obviousness of claim 26.

C. ALL OTHER REJECTED DEPENDENT CLAIMS ARE PATENTABLE OVER THE RECITED COMBINATIONS OF PRIOR ART

All additional rejections to dependent claims 6, 18, 14, 25, 20 and 24 are based on at least the combination of Patel, O'Grady and Fitch. Accordingly, it is respectfully submitted that these dependent claims are patentable over the combination of Patel, O'Grady, Fitch and whatever additional reference is cited for at least the same reasons as independent claims 1 and 15.

All additional rejections to dependent claims 30, 24 and 36 are based on at least the combination of Patel, O'Grady and Charoubi. Accordingly, it is respectfully submitted that these dependent claims are patentable over the combination of Patel, O'Grady, Charoubi and whatever additional reference is cited for at least the same reasons as independent claims 26.

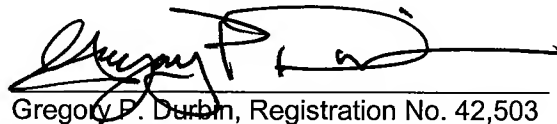
VIII. CONCLUSION

Appellant respectfully submits that all the appealed claims in this application are patentable and requests that the Board of Patent Appeals and Interferences direct allowance of the rejected claims.

This Appeal Brief is submitted contemporaneously with a petition for a one-month extension of time in accordance with 37 CFR § 1.136(a). Accordingly, please charge Deposit Account No. 04-1415 in the amount of \$620.00 (\$500.00 for Appeal Brief fee and \$120.00 for a one-month extension of time fee. The Applicant believes no further fees or petitions are required. However, if any such petitions or fees are necessary, please consider this a request therefor and authorization to charge Deposit Account No. 04-1415 accordingly.

Dated: July 25, 2007

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Gregory P. Durbin', is written over a horizontal line.

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IX. APPENDIX OF CLAIMS

1. A system for permitting orderly shutdown of electronic components, the system comprising:
 - an enclosure having an interior surface;
 - one or more electronic components positioned within the enclosure;
 - at least one fan positioned within the enclosure for generating an airflow across the one or more electronic components;
 - a heat exchanger for cooling the airflow; and
 - a plurality of phase change material layers disposed upon the interior surface, at least one of the layers exposed to the airflow within the enclosure generated by the fan for absorbing heat from the airflow upon a failure associated with the heat exchanger, a first phase change material layers having a phase change temperature different from a second of the phase change material layers.
2. The system according to claim 1, wherein at least one of the layers of the phase change material has a phase change temperature that is above a temperature of the airflow when there is no failure associated with the heat exchanger, and below a maximum operating temperature of the one or more electronic components.
3. The system according to claim 1, wherein the heat exchanger is a fluid to air heat exchanger.
4. The system according to claim 3, wherein the fluid to air heat exchanger is coupled to a fluidic circuit.
5. The system according to claim 4, wherein the fluidic circuit circulates one of a refrigerant and water.
6. The system according to claim 1, wherein the heat exchanger is a thermoelectric device.
9. The system according to claim 1, wherein the phase change material is in micro-encapsulated form that is embedded in a coating applied to one or more interior surfaces of the enclosure.

10. The system according to claim 1, wherein one or more interior surfaces of the enclosure is coated with the phase change material, the phase change material encapsulated by a sealing coat.

11. The system according to claim 1, further comprising:
a temperature sensor for sensing temperature within the enclosure; and
a high-temperature indication indicative of a high temperature within the enclosure, the high temperature being lower than a phase change temperature of the phase change material.

12. The system according to claim 1, wherein the phase change material is a material chosen from the group of materials consisting of a paraffin, a hydrated salt, a metal, an alloy, and an organic acid.

13. The system according to claim 1, wherein the at least one fan substantially recirculates air within the enclosure.

14. The system according to claim 1, wherein the one or more electronic components includes at least one blade server.

15. A method for cooling one or more electronic components positioned in an enclosure, the method comprising:
providing an air cooling element within the enclosure;
generating an airflow across the cooling element and one or more electronic components positioned within the enclosure; and
cooling the airflow using a plurality of layers of phase change material upon a failure in the cooling element, the phase change material positioned on an interior surface of the enclosure and exposed to the airflow within the enclosure generated by the fan.

16. The method according to claim 15, wherein providing the air cooling element includes: moving fluid through a fluidic circuit, the fluidic circuit including a fluid to air heat exchanger.

17. The method according to claim 16, further comprising pumping one of a water and a refrigerant through the fluidic circuit.

18. The method according to claim 15, wherein the air cooling element is a thermoelectric device.
19. The method according to claim 15, further comprising providing an indication indicative of a high temperature condition within the enclosure.
20. The method according to claim 15, further including shutting down the one or more electronic components upon a failure in the fluidic circuit.
21. The method according to claim 15, wherein the phase change material has a melting point that is above a temperature of the airflow when there is no failure in the air cooling element, and below a maximum operating temperature of the one or more components.
23. The method according to claim 15, further comprising encapsulating the phase change material in a surface positioned within the airflow.
24. The method according to claim 15, further comprising: applying the phase change material to a surface positioned within the airflow, and applying a sealing coat on top of the phase change material.
25. The method according to claim 15, wherein the one or more electronic components includes at least one blade server.
26. A cooling system comprising:
an enclosure;
one or more electronic components positioned within the enclosure;
means for generating an airflow across the one or more electronic components;
cooling means for cooling the airflow; and
a phase change material at least partially comprising a hydrated salt and positioned within the enclosure in the airflow generated by the means for generating an airflow across the one or more electronic components, the phase change material for absorbing heat from the airflow upon a failure in the cooling means.
27. The cooling system according to claim 26, wherein the means for generating the airflow includes a fan.

28. The cooling system according to claim 26, wherein the cooling means includes a fluid to air heat exchanger.
29. The cooling system according to claim 28, wherein the fluid to air heat exchanger is coupled to a fluidic circuit that circulates one of a refrigerant and a water.
30. The cooling system according to claim 26, wherein the cooling means includes a thermoelectric device.
31. The cooling system according to claim 26, wherein the phase change material is enclosed in a container.
32. The cooling system according to claim 31, wherein the container includes fins for dissipating heat.
33. The cooling system according to claim 26, wherein the phase change material is encapsulated in a surface positioned within the airflow.
34. The cooling system according to claim 26, wherein one or more surfaces of the enclosure is coated with the phase change material, the phase change material encapsulated by a sealing coat.
35. The cooling system according to claim 26, wherein the phase change material is a material chosen from the group of materials consisting of a paraffin, a hydrated salt, a metal, an alloy, and an organic acid.
36. The method according to claim 26, wherein the one or more electronic components includes at least one blade server.

X. EVIDENCE APPENDIX

None.

XI. RELATED PROCEEDINGS APPENDIX

None.